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ABSTRACT

Studies on handicap parking reveal the existence of a significant problem of unauthorized use of designated handicap spaces. This study examined various demographic variables involved in the illegal use of handicap parking spaces. Subjects (N=266) were drivers of vehicles observed in handicap parking spaces in three grocery store parking lots. Each time a vehicle was observed in a targeted handicap space, as the drivers got out of the car, observers filled in the appropriate data which indicated the sex, age (over or under 25), and race (white or non-white) of the driver and whether they had a handicap tag or not. Parking lot count, weather conditions, time of arrival and departure, and the license plate number were also recorded. Of the 266 total observations, 165 (62 percent) did not display proper handicap identification. The relative number of violations was higher for young (under the age of 25) drivers and for non-white drivers. Although it is difficult to generalize the findings from one community, it is possible that if the rates of violation differ across groups than the effects of intervention strategies may also differ across different demographic groups. (ABL)

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Handicap Parking: A Demographic Study of Legal and Illegal Users

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Running Head: HANDICAP PARKING

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Handicap Parking: A Demographic Study of Legal and Illegal Users

Studies on handicap parking reveal the existence of a significant problem of unauthorized use of designated handicap spaces. Matthews (1981) found that 76.1% of 328 observed vehicles were in violation of regulations with no handicap tag or plate and no observable handicap in the driver.

Several studies have suggested strategies which were found to be effective in decreasing the amount of illegal use of handicap parking spaces. Jason and Jung (1984) used a multiple baseline design to test the effects of vertical signs and ground markings. It was found that the use of a vertical sign decreased and eventually eliminated violations of handicap parking regulations in a university parking lot. Suarez de Balcazar, et al. (1988) also found that the use of a clearly visible sign helped decrease parking violations in handicap spaces in two grocery store parking lots.

White, et al. (1988) further developed this design by comparing the use of standard handicap signs which displayed the international symbol with signs displaying special warnings indicating a $250 fine for unauthorized use of the parking space. They found that the use of signs with special warnings were more effective in decreasing the frequency and minutes per hour of illegal parking in two grocery store parking lots.

In the only study documenting the effect of behavioral consequences, Suarez de Balcazar, et al. (1988) found that a

non-publicized police crackdown decreased the average percentage of intervals of unauthorized parking and the frequency of illegal parking. This decreasing effect continued even after the police enforcement was reduced, indicating its lasting impact.

The present study is an attempt to examine various demographic variables involved in the illegal use of handicap parking spaces. The data presented in this paper serve as the baseline component for an ongoing study of various intervention techniques. Because of the use of a limited population and limited number of locations, generalizations of the results of this study to other populations should be considered cautiously.

Method

Subjects and Procedure

266 drivers of vehicles observed in handicap parking spaces in three grocery store parking lots served as subjects. The stores were chosen based on the fact that they were all located in well developed commercial areas in Greenville, North Carolina, and served equally similar populations of local families and college students. Four handicap spaces were observed each at Foodland and Food Lion while only two spaces were observed at Kroger. All spaces were clearly visible from the fronts of the stores and were marked either with a handicap symbol painted on the ground (Foodland), posted on a sign (Kroger), or by a combination of both ground paint and a posted sign (Food Lion). Diagrams representing the layout of each parking lot are shown in Figures 1, 2, and 3. The forty numbered parking spaces are those determined to be closest to the handicap spaces. These spaces provided a "lot count" at

the time of each observation used to determine whether violations occurred more often when the lot was full, therefore making the handicap space more convenient.

Insert Figures 1, 2, and 3 about here

All observations were made between 4:30 and 6:00 p.m., Monday through Friday. Target spaces were observed for 26 days by one or two (when possible) trained undergraduate observers standing in front of the store. A sample data sheet is shown in Figure 4. Each time a vehicle was observed in a targeted handicap space, as the driver got out of the car, observers filled in the appropriate data to indicate the sex, age (over 25 or under 25) and race (white, non-white) of the driver and whether they had a handicap tag or not. Lot count, weather conditions, time of arrival and departure, and the license plate number were also recorded. Because of patrons and bag boys entering and exiting the store and general pedestrian traffic, the purpose of the data collectors was not obvious to the people using target handicap spaces.

Insert Figure 4 about here

The observers were allowed to confer on the license plate number but were instructed to record all other data independently in order to assess reliability. Estimates of reliability were obtained for 45 (17%) of the 266 observations. Inter-observer agreement was determined by

dividing the number of times the two observers agreed on a particular response category by the total number of matched observations and multiplying by 100. The following percentages were obtained for each item: a) 100% agreement for sex, age, weather conditions and handicap plate; b) 96% agreement for race; c) 67% agreement for lot count; d) 51% agreement (to the nearest minute) for arrival time, and e) 38% agreement for departure time. Although the percentages of agreement for arrival and departure times are not very high, the actual differences in times recorded to the nearest minute were very small. Therefore, these low reliabilities may be partially due to differences in the observers' watches at the time of data collection.

Results

The sample was largely made up of white subjects (67.7%) who were above the age of 25 (85.7%). The sample was split equally between males (48.9%) and females (51.1%). More observations were obtained at Foodland (42.9%) and Food Lion (31.6%) than at Kroger (25.6%).

Of the 266 total observations, 165 (62.0%) were of cars that did not display proper handicap identification. As shown in Figure 5, the pattern of cars in violation of the law was fairly consistent throughout the observation period. The percentage of legal parkers exceeded that of illegal parkers only six times during the 26 days of observation.

Insert Figure 5 about here

Significant differences in the number of parking violations were found across the three locations, ($X^2_{(2)} = 12.69$, $p<.005$). Of those found to be parked illegally, 50.9% were observed at Foodland, 29.1% at Food Lion, and 20.0% at Kroger. Kroger was the only location where the overall percentage of illegal parkers (48.5%) was lower than that for those parked legally (51.5%).

The difference between the percentage of males (59.2%) and females (64.7%) observed parking illegally was not found to be significant, ($p>.05$). It was found, however, that the percentage of violations for drivers under the age of 25 (94.7%) was significantly higher than the percentage of violations (56.6%) for drivers over the age of 25, ($X^2_{(1)} = 20.14$, $p <.001$).

Race was also found to be significant, with the percentage of non-white subjects parked illegally (82.1%) being much higher than the percentage of white subjects observed parking illegally (53.3%). This difference was found to exist across all three locations as can be seen in Table 1.

Although subjects parked illegally tended to stay in the store for a shorter period of time than those parked legally, ($F_{(1,240)} = 7.34$, $p=.007$), there were no significant differences for sex, race, or age and amount of time spent in the store.

The average lot count across locations for each observation was 29.1 out of 40. This was not found to be significant for any of the variables examined.

Most of the observations were recorded in clear weather conditions (85%). It was found, however, that the ratio of violators to non-violators was higher in rainy conditions (3 to 1) than in clear conditions (1.5 to 1). Apparently, violations are twice as likely to occur in ran than in clear weather conditions.

Discussion

The overall findings of this study indicate that a large majority of people who use handicap parking spaces are doing so illegally, although they do tend tc spend less time in the space than those parking there legally. These results are not surprising, given that handicapped patrons may take longer to shop due to their disability, while those parked illegally may wish to remain in the store only a short time in order to escape public or legal sanction.

The relative number of violations was higher for young (under the age of 25) drivers and for non-white drivers. It should be noted that all subjects classified as non-white were black, except for two. Although it would be difficult to generalize the findings from one community, it is possible that if the rates of violation differ across groups then the effects of intervention strategies may also differ across different demographic groups.

Kroger had the lowest violation rate of all three locations. This finding may be partially due to the use of a vertical sign. It is the feeling of the researchers, though, that one reason for the difference in violation rates at Kroger and Food Lion (who also used a vertical sign in combination with ground paint) is that a fire lane in front of Kroger was

a more convenient short term parking space than the nearby handicap spaces. Several customers were observed using this fire lane, although no data was collected related its use. Each of the other stores had barriers in the fire lanes, making parking more difficult than in the fire lane at Kroger.

Foodland had the highest rate of violations, a finding which is consistent with previous literature because partially faded symbols painted on the ground were the only indication that the spaces were reserved for handicap drivers.

The current literature in this area has been largely unable to provide adequate demographic data on samples or detailed information on sites studied. Consequently, given the indications in this study of intergroup and location differences, much remains to be done before conclusions about when and where specific interventions will be most effective.

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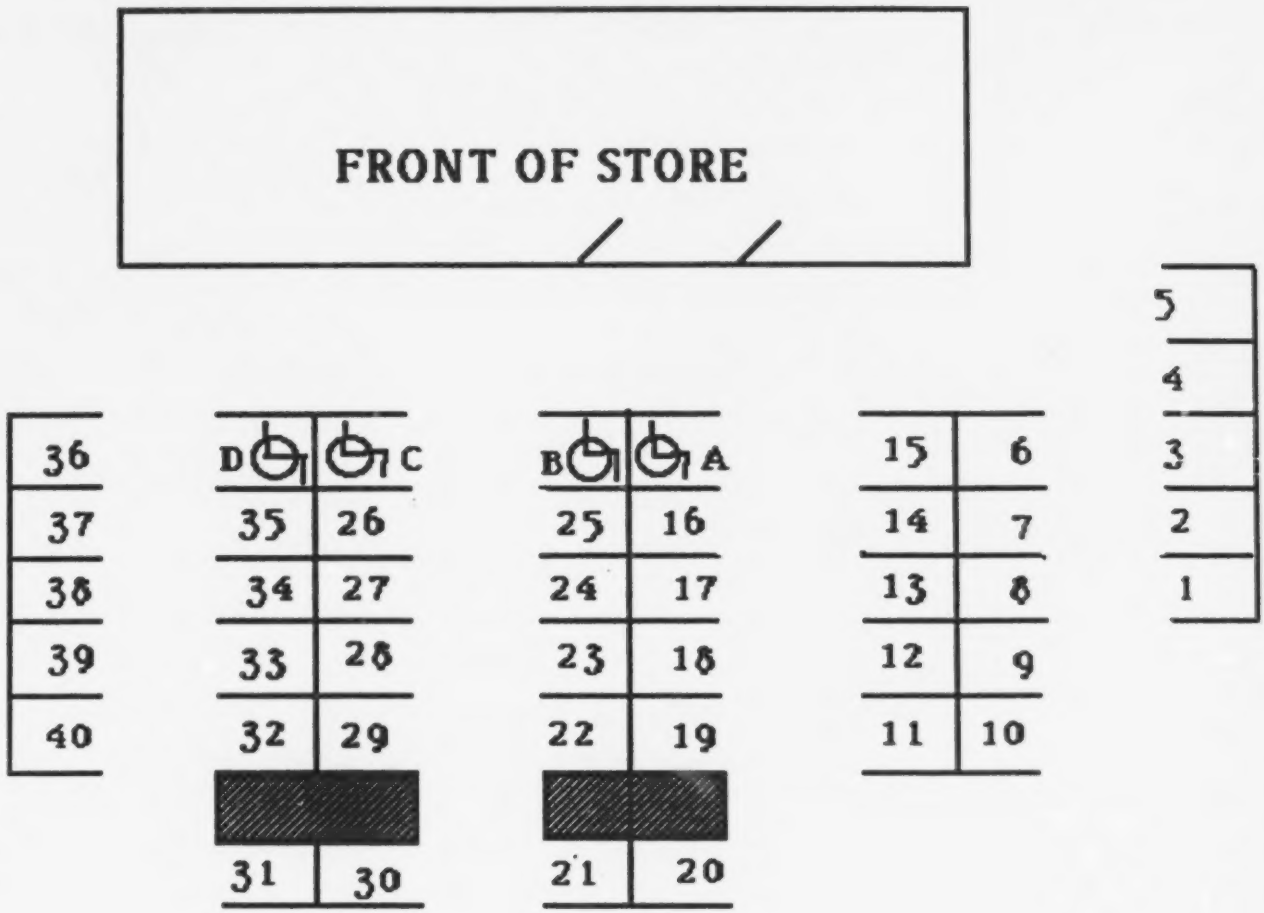
FOODLAND PARKING LOT

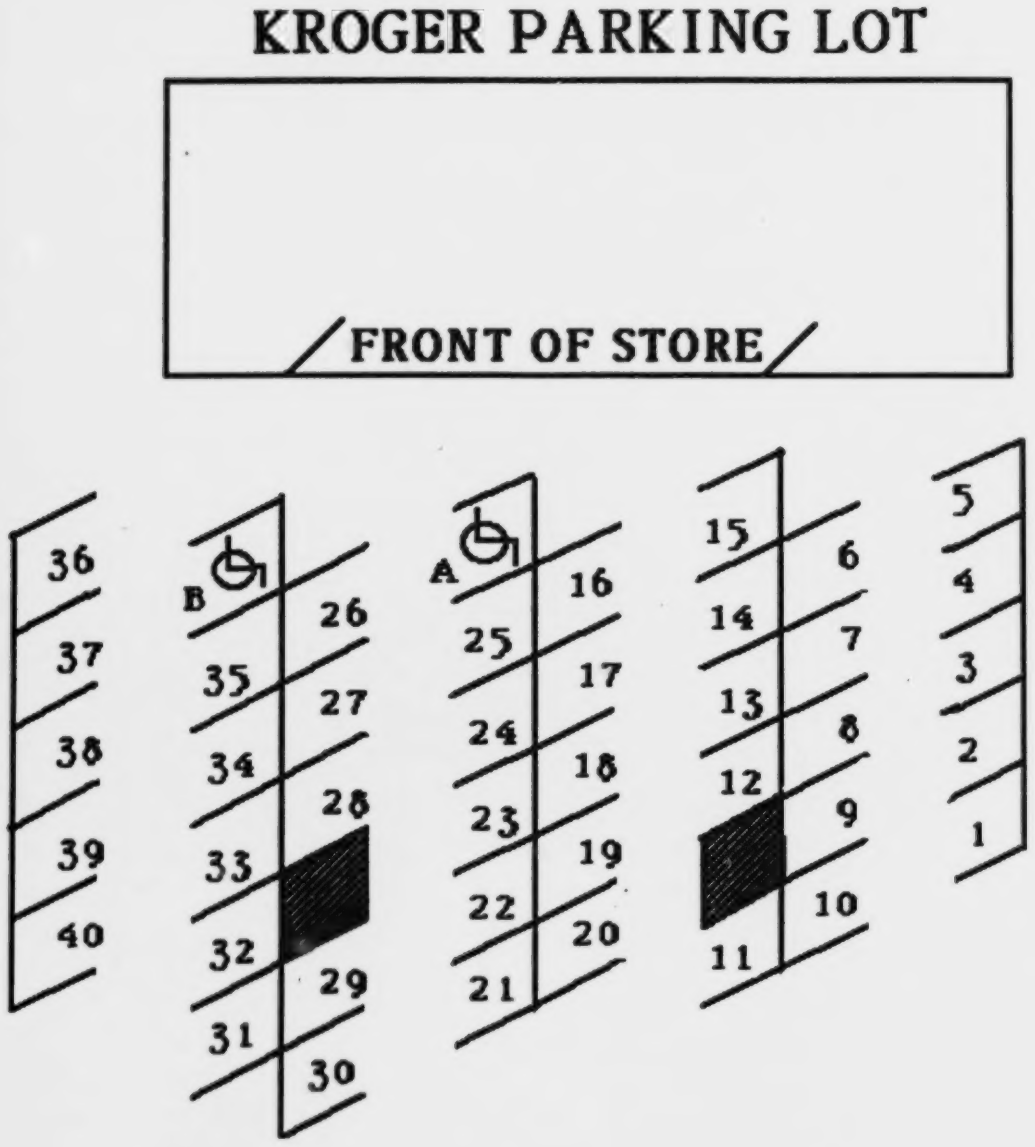
(Handicap Symbol painted on ground)

FOOD LION PARKING LOT



(Handicap Symbol painted on ground and posted on sign)

Figure 3.



(Handicap Symbol posted on sign)

DATA SHEET

NAME:_____ LOCATION: _____ DATE: _____ TIME:_____

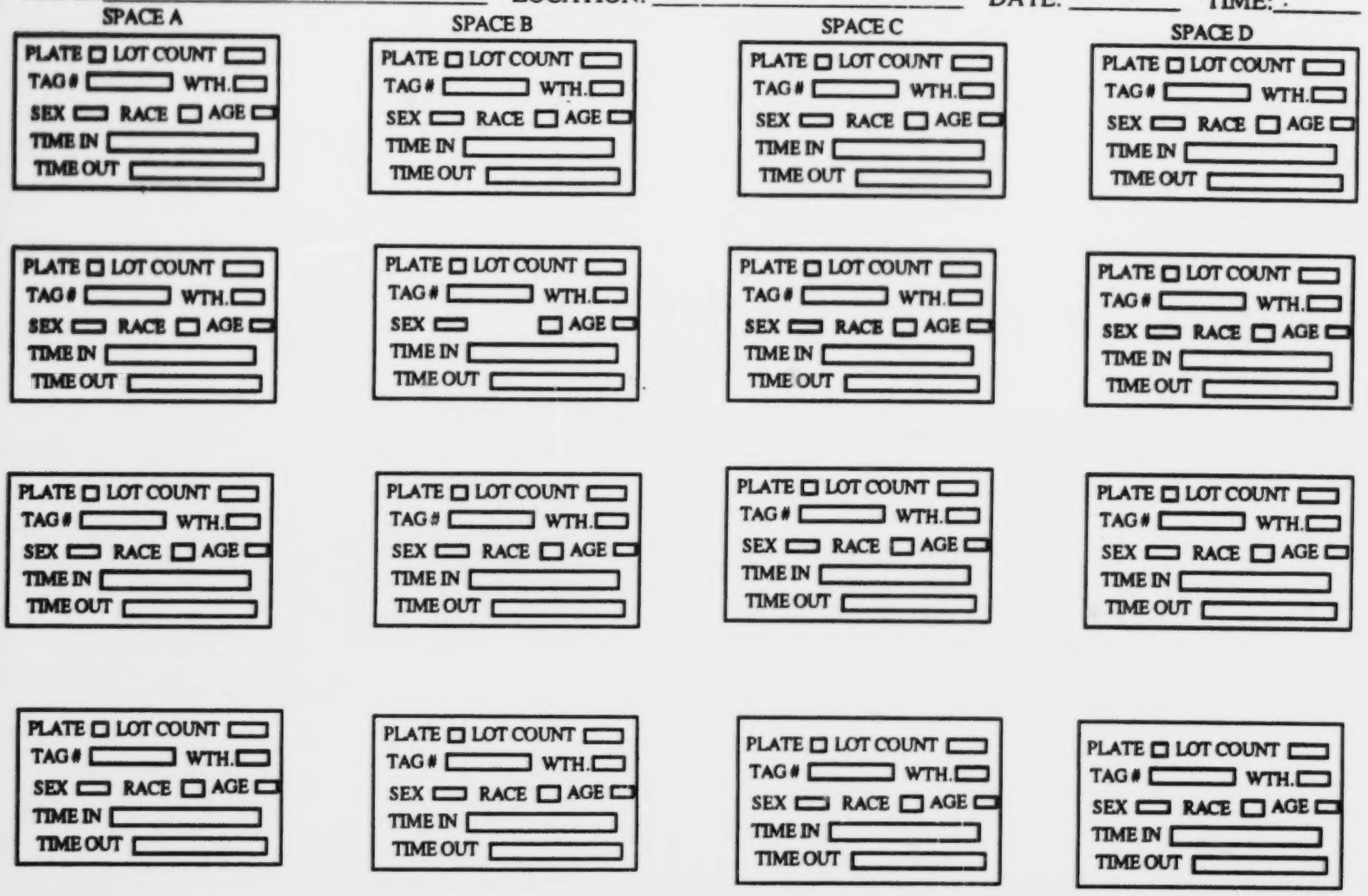


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Figure 4.

Handicap Parking

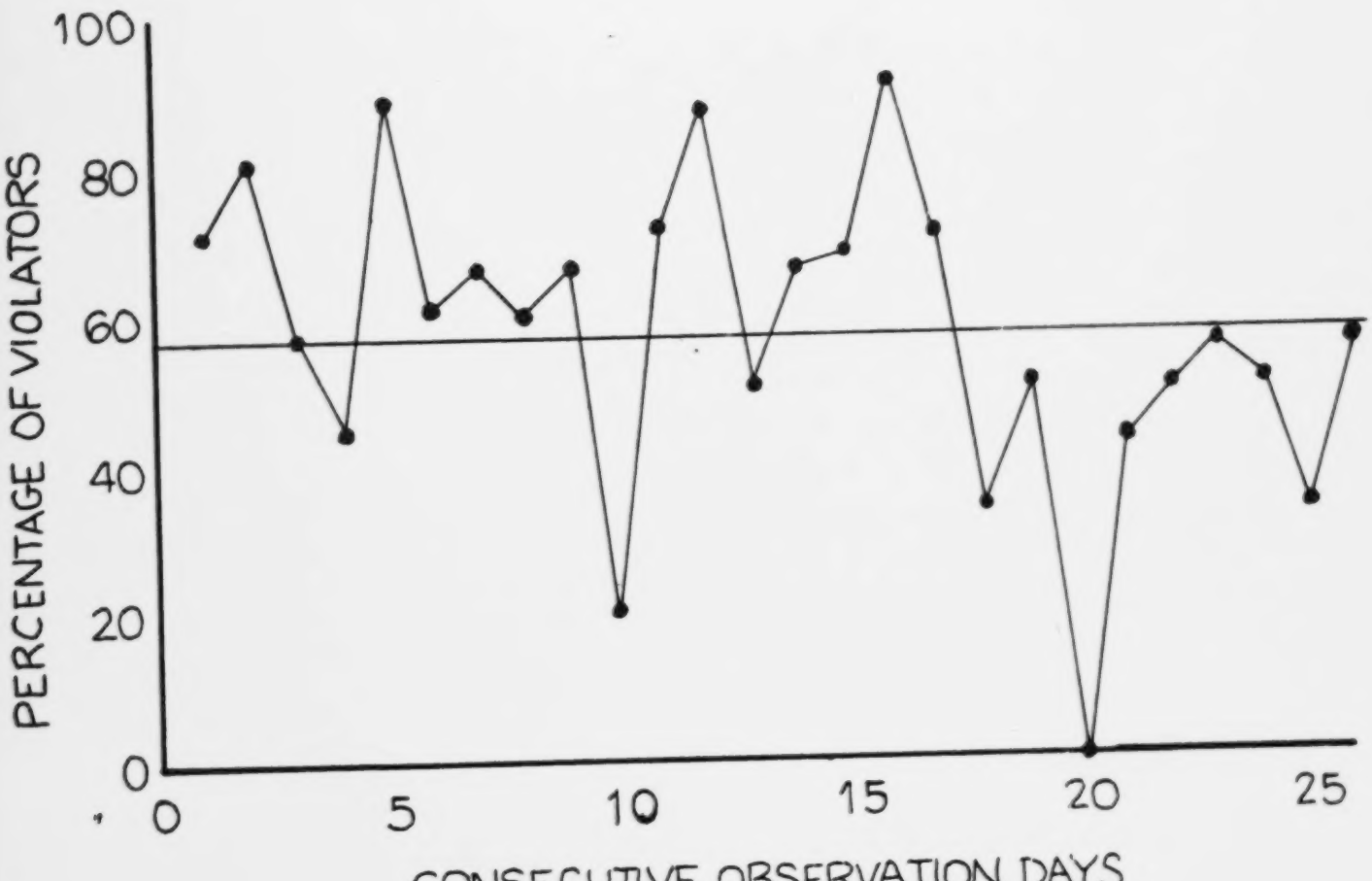
100
80
60
40
20
0
PERCENTAGE OF VIOLATORS
0
5
10
15
20
25
CONSECUTIVE OBSERVATION DAYS
$\overline{X}$ =57.46

Figure 5.

Table 1

Percentage of Handicap Violations as a Function of Race and Location

	FOODLAND		FOOD LION		KROGER	
	VIOLATORS	LEGALS	VIOLATORS	LEGALS	VIOLATORS	LEGALS
NON-WHITES						
N	40	8	20	6	7	3
%	83.3	16.7	76.9	23.1	70.0	30.0
WHITES						
N	43	22	28	30	25	32
%	62.2	33.8	48.3	51.7	43.9	56.1